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Project #5 - Data Structures and Generics

Java Code:

```
import java.util.*;
public class Project5{

	public static ArrayList<Integer> iterativeReverseList(ArrayList<Integer> arraylist){
		int[] listarr=new int[arraylist.size()];

		for(int counter = arraylist.size() - 1, j = 0; counter >= 0 && j < 
arraylist.size(); counter--,j++){
			listarr[j] = arraylist.get(counter);
		}

		ArrayList<Integer>reverselist=new ArrayList<Integer>();

		for(int j = 0; j < listarr.length; j++){
			reverselist.add(j, listarr[j]);
		}

		return reverselist;
	}

	private static ArrayList<Integer> recursiveReverseList(ArrayList<Integer> 
arraylist) {
		if(arraylist.size() > 1){
			Integer val = arraylist.remove(0);
			recursiveReverseList(arraylist);
			arraylist.add(val);
		}

		return arraylist;
	}

	public static ArrayList<Integer> insertSort(ArrayList<Integer> arraylist) {
```

```
        int[] array=new int[arraylist.size()];

        for(int j = 0;j < arraylist.size(); j++){
                array[j] = arraylist.get(j);
        }

        for (int j = 1; j < array.length; j++) {
                int key = array[j];
                int i = j-1;
                while((i > -1) && (array [i] > key)){
                        array [i+1] = array [i];
                        i--;
                }
                array[i+1] = key;
        }

        ArrayList<Integer> sortedlist=new ArrayList<Integer>();

        for(int j = 0;j < arraylist.size(); j++){
                sortedlist.add(j, array[j]);
        }

        return sortedlist;
}

//Example Test method
public static void main(String[] args) {
        ArrayList<Integer>list=new ArrayList<Integer>();
        list.add(1);
        list.add(2);
        list.add(3);
        list.add(4);
        list.add(5);
        list.add(6);
        list.add(7);
        list.add(8);
        list.add(9);
        list.add(10);
        list.add(11);
```

```
                list.add(12);
                list.add(13);
                list.add(14);
                list.add(15);
                list.add(16);
                list.add(17);
                list.add(18);
                list.add(19);
                list.add(20);
                System.out.println("Starting List: " + list + "\n");
                ArrayList<Integer> arr =iterativeReverseList(list);
                System.out.println("Reverse List in Iteration: " + arr.toString() + "\n");
                ArrayList<Integer> rever = recursiveReverseList(list);
                System.out.println("Reverse List in Recursion: " + rever.toString() + "\n");
                System.out.println("Sorted List: " + insertSort(list));
        }
}
```

Test Results: